Guidebook on a foresight exercise For decision- makers

With two example of application of ICZM in Nile delta northern lakes (Egypt; Pegaso workshop; 2013)
and on priorities in research and development for aquaculture in Indonesia (Univ. Gent; 2008)

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Guidebook for foresight exercise
Project PEGASO (FP7/ENV/*ICZM*)
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Content

Introduction

Foresight analysis is used for millenniums but reliable methods had been developed after the 2nd World War. Several tools are available, but the aim remains the same: to clarify the conditions of a decision and to enrich the knowledge on the consequences of this decision. This ambitious goal requires all resources of human intelligence and notably various methods, from quantitative approaches or qualitative ones. Simples rules have to be considered: freedom of thinking, multiplicity of data sources, open discussion, collective intelligence based on "bainstorming", elaboration of recommendations.

The objective of this exercise is to propose to decision makers, in a given field, **a simple and user-friendly method.** In a precise time horizon and selected territory limits. This method should give them the capacity to undertake similar analysis whenever they need it inn order to test the robustness of the conclusions and priorities. As a method is detailed in 4 simple steps, this work can be replicated with all required adaptations according to the focus of the study, the long term objectives, the partnership, etc. This method is a new mean for applied foresight in the toolbox of PEGASO (EU programme which involved several Mediterranean countries from 2011 to 2014) This guidebook will be available in four languages: French, English, Arabic and Turquish.

Table 1 presents the time schedule

TABLE 1: TIME SCHEDULE FOR THE EXERCISE

DAY/ time	**1**	**2**
Morning	Lectures on foresight usefulness in general and applied examples Open questions	**STEP 2**: Presentation of the conclusions of the 5 (or 6) WG Matrix building Scenarios selection (3or 4) **STEP 3:** Impacts of scenarios on sectors and actors. Set of the 3 WG (3 or 6 Working groups)
Lunch break:		
After noon	Introduction to DEGEST Method; Presentation of focus, sectors and actors **STEP 1 :** Working groups on the 5 (or 6) Degest parameters	Reporting of the 3 (up to 6) WG on impacts of scenarios on sectors and actors **STEP 4:** Open discussion on priorities and strategies if scenarios are equivalent Then, vote Recommendations for a roadmap Lectures assessment Conclusion

1. First step: the DEGEST parameters

Method

The method is inspired by the American school of Futuring (Cornish, 2004; Schwartz, 2007) and is named DEGEST. It is combined with the scenarios building, as refined by the French school of foresight (Gaudin, 1990; Godet, 1991; Jouvenel, 2004). This scenario method is the most used method in foresight analysis.

The principle of the method is based on an observation of Cornish: 95% of determining parameters in scenarios building can be sorted in 6 mains factors, whatever the study:

Demographics
Environment
Governance (1)
Economics
Society (1)
Technology (including. science)

(1) Governance and society may be merged if required

Participants (or the leader) decide on

1. The space limits (country, région…),
2. The time horizon (2025, 2030…)
3. The issues to study (which priorities for research and development in fisheries and aquaculture for exemple).

The participants are split in 5 groups as Governance and Society are merged. One group for each variable.

The objective of each working group is to select three or four main hypothesis for the evolution of the parameter for the horizon of 2030 within the space limits which have been selected.

These hypotheses have to be realistic but contrasted enough to differ significantly from one to another. The outlines of each hypothesis have to be summarized in few words (less than 10) in order to be easily presented in a table.

The group selects one moderator, one secretary and one speaker for the presentation of the results to the audience.

At the end of the work in groups (1 to 2 hours), all hypotheses are collected in one table.

An example of this step is given in annex 1, for Egypt, in 2013. This analysis was achieved in the frame of a study on integrated coastal zone management in the low delta of the Nile (Pegaso workshop; Dec. 2013)

TABLE 2 : Matrix of hypothesis for Egypt

HYPOTHESIS FIELD	1	2	3
DEMO-GRAPHY			
ENVIRON-MENT			
GOVER-NANCE & SOCIETY			
ECONOMICS			
TECHNO-LOGY (& SCIENCE)			

2. Second step: Matrix and scenarios

All groups report the three main hypotheses in each field.
Then the global matrix can be filled (table 2; Example given in Annex 1)

The next step is the selection of three (or four) main scenarios, for the whole country (if it is the space frame), for the horizon of 2030 (if it is the time horizon).

The rule of construction is to select one hypothesis for each parameter.
It is compulsory to select successively the hypothesis of the first parameter (Demography). This means that the exercise is processed three times.
It is compulsory to select one hypothesis in each parameter. This has to be done according to the global vision given by the selected hypothesis. It must be consistent and coherent to the hypothesis which are progressively selected
A same hypothesis in a parameter can be selected for two different hypothesis in Demography.
Once the group has three sets of hypothesis, it has to check the global consistency of each set.

Then the group gives a "title" to the selected scenario in order to facilitate the discussion (example given in annex 2)

For example, after discussion, the group selects the following set of hypothesis:

Demography: Hypothesis 1
Environment Hypothesis 3 BECAUSE this hypothesis sounds to be the most likely according to the hypothesis of Demography
Governance: Hypothesis 1, because, once again, this hypothesis fits with the ongoing scenario
Economics: Hypothesis 3 for the same reasons
Technology and science: Hypothesis 2 as this scenario is now relevant and coherent with this last selection of hypothesis.

Then this selection is repeated for “Demography / Hyp. 2” and “Demography / Hyp. 3”.

An example is given in Annexe 2 with the complete set of hypothesis for each scenario and the selected title (from the participants)

3. **Third step**: Impacts of scenarios on sectors and actors

The group is now split into 3 groups (or 4 if there is 4 scenarios):
The group 1 is in charge of the Scenario 1
The group 2 is in charge of the Scenario 2
The group 3 is in charge of the Scenario 3

Another way for the collective work is to split the participants into the sectors/actors ((or 6 for example) instead of classing them by scenario.

Each group has to consider successively the impacts of the scenario on

1. The 3 main sectors of activity
   1. SECTOR 1 : Natural resources such as minerals, water, living organisms...
   2. SECTOR 2 : Industry and processing; all transformation activities from material, from Oil to nanos-technologies…
   3. SECTOR 3 : Services such as tourism, banks, insurance, transportation, electronics networks in Internet and outside Internet...

Each group has then to analyse, according the scenario, the priorities of the main actors (stakeholders)

2. The 3 priorities of actors
   1. the ACTORS A (State, Ministries, regional authorities...)
   2. the ACTORS B (Civil society, companies, associations, syndicates, NGOs...)
   3. the ACTORS C (Research and development; in international, public and private

The key question for each "box" of the table (see the table 3 on the following page) is: **which would be the impacts of each scenario on**

- **the activities of the sector**
- **the priorities of the actors?**

IMPORTANT COMMENT:
In order to avoid to deal with all the issues of the country, the analysis is limited here in the interactions between the main sectors and the main actors within the TARGETED FIELD OF STUDY. This means, in this example, the main economic sectors (primary, secondary, tertiary) and the selected actors.

In the example of Egypt (See Annex 3) the fields are limited to the lakes of the low delta of the Nile. Sectors and actors remain very general, according to the presented method.
In the example of Indonesia, the annexes 5 to 7 show the results in the field of aquaculture at the horizon of 2030. Sectors and actors are much more precise.
During a similar exercise in Algeria, sectors and actors have been carefully selected;
Sectors: Fisheries, aquaculture, interactions (+ others sectors) Society, rules and regulations, Markets, Research
Actors: Ministries, Production units, society, international partners, research, development, education and training, Media.

TABLE 3: Impacts of scenarios on Sectors and Actors priorities

NB : this analysis has to be done in the FIELD OF STUDY

Scenario / Criteria	Scenario 1	*Scenario 2.*	Scenario 3
SECTOR 1 Natural resources			
SECTOR 2 Industry and processing			
SECTOR 3 Services			
ACTOR A State, Ministries, regional authorities			
ACTOR B Civil society, companies, associations, syndicates, NGOs...			
ACTOR C Research and development			

4. Fourth step: Discussion and recommendations for stakeholders

The table 3, when completed, is a support to discussion.

Two visions can be used for **the selection of a strategy for a concrete roadmap**.

(1) The “optimum” scenario, which may be also the “realistic” one, involves the selected priorities which have been processed in the third step. More detailed recommendations can be then discussed in order to shape an adapted roadmap;

(2) The second vision is to consider that all scenarios have the same probability to occur. Then decision makers may intend to look for a nucleus of necessary priorities, which show to be similar, whatever the scenario. It is also called "**Measures without regret**".
Thus, working groups are asked to prepare a selection of recommendations.

After some time given to the working groups, all recommendations are collected and projected on screen. The next step is to present each recommendation and to count the vote of all experts in order to select the main recommendations. An example is given in annex 4.

If requested, a more structured roadmap may be fine-tuned.

If needed, three complement studies can be launched.

- The first one is to test the robustness of the first foresight study through a second study, with other experts and additional parameters (“field”). This reset allows to see if the conclusions converge to similar results or if a completely different vision is deduced.
- The second one is to test the compatibility and the relevance of the results with existing national policies.
- The third one is to compare the results with similar situations in other countries through a benchmarking. This study is al the more useful than foreign experts are asked to participate to this benchmarking.

As a conclusion, this exercise in foresight analysis is as valuable for the participants (brainstorming, open discussion, appropriation of priorities…) as for the selection of recommendations.

Last work : The assessment of the workshop by the participants in order to improve it (method, presentation…). Table 4 shows a standard template which has been used efficiently.

TABLE 4 : Standard template for workshop assessment

Make a circle around the answer you consider to be right.
Additional comments are free. To be presented in Recto-Verso

Lecture	**Introduction to foresight analysis**			
Global quality of the presentation	Excellent	Good	Acceptable	Bad
Global quality of the content	Excellent	Good	Acceptable	Bad
Usefulness of this introduction	High	Good	Moderate	To be discussed
FREE COMMENT				

Study	**Collective work**			
General quality	Excellent	Good	Acceptable	Bad
Time given to the different phases	Well adapted	Too short	Too long	Not well balanced (reasons?)
Usefulness of this study	High	Good	Moderate	To be discussed
FREE COMMENT				

Complementary comment (free) on the global interest of the study

Some references

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Annex 1: Example of Matrix of hypothesis for Egypt (2013)

HYPOTHESIS FIELD	1	2	3
DEMO-GRAPHY	Pop increases, One million / year, Devpt in rural areas so decongestion of towns. 102 Million	Small decrease of rate of increase, Still big towns No strong emigration, 102 Million	Plus 1,5 Million / yr, No incentives for outskirts or out, Overpopulation in cities and social pbs 111 Million
ENVIRON-MENT	Increase environmental degradation, Impacts on economy, Numerous bad spots	Main threats from climate change, Sea level rises Lido displacement, Reduced gov services	Better evolution related to better governance, control of industry and urbanization
GOVER-NANCE & SOCIETY	Future of hope , stable governance, Good quality of R and D Devpt, Good negociation	No progress, Weak gov, Conflicts notably in aquaculture, Instability, Less cooperation	
ECONOMICS	Bad situation, Annual growth limited to 3, Reduction of living standards	Slight improvement thanks to growth of 5, More tourism, Better justice, More entrepreneurs	Optimistic one, Better growth up to 7. Political and social stability, Higher standards
TECHNO-LOGY (& SCIENCE)	Education : continuity as usual (=Bad) Transfer of techno: Bad Quality system : No Weak interdisciplianry work	Educ: THE Revolution TT : Follow the right scientific way for TT QS : Developed IW : Increased	Educ : Gradual change TT: Follow the right scientific way for TT QS : Developed IW : Increased

Annex 2: Example of Matrix of scenarios for Egypt (2013)

HYPOTHESIS FIELD	1	2	3
DEMO-GRAPHY	**Best. Pop increases, One million / year, Devpt in rural areas so decongestion of towns. 102 Million**	*Medium. Small decrease of rate of increase, Still big towns No strong emigration, 102 Million*	Bad, Plus 1,5 Million / yr, No incentives for outskirts or out, Overpopulation in cities and social pbs 111 Million
ENVIRON-MENT	*Increase environmental degradation, Impacts on economy, Numerous bad spots*	Main threats from climate change, Sea level rises Lido displacement, Reduced gov services	**Better evolution related to better governance, control of industry and urbanization,**
GOVER-NANCE & SOCIETY	***Future of hope , stable governance, Good quality of R and D Devpt, Good negociation***	No progress, Weak gov, Conflicts notably in aquaculture, Instability, Less cooperation	
ECONOMICS	Bad situation, Annual growth limited to 3, Reduction of living standards	*Slight improvement thanks to growth of 5, More tourism, Better justice, More entrepreneurs*	**Optimistic one, Better growth up to 7. Political and social stability, Higher standards**
TECHNO-LOGY (& SCIENCE)	Education : continuity as usual (=Bad) Transfer of techno: Bad Quality system : No Weak interdisciplianry work	**Educ: THE Revolution** **TT : Follow the right scientific way for TT** **QS : Developed** **IW : Increased**	*Educ : Gradual change* *TT: Follow the right scientific way for TT* *QS : Developed* *IW : Increased*

Scenario 1 Bold : **".Utopia or Wonderland."**
Scenario 2 Italic : *".Good planning in difficulties..."*
Scenario 3 Underlined : " Current situation.....

Annex 3: Example of Impacts of scenarios on Sectors and Actors priorities involved in ICZM (Egypt, 2013)

Scenario **Item**	**Scenario 1** **Utopia or Wonderland** ***(WGs; Economy and Demography)***	***Scenario 2.*** ***Planning in difficulties*** ***(WG : Environment)***	**Scenario 3** **Current situation** ***(WG : Governance and Science)***
SECTOR 1 Natural resources	Optimum use of resources, preservation and ensurance of sustainibility	More stress on available resources	Loss of natural resources
SECTOR 2 Industry and processing	Greener practices, less pollution, reduction of unemployment, Better income, added value of processing, more globalization	Slight improvement	Collapse of industry, rise of black work
SECTOR 3 Services	More services, in quality and quantity	Same situation or may be some slight improvement	Poor or limited services
ACTOR A State, Ministries, regional authorities	Better policy enforcement and rationalisation of policies and legislation, reduction of bureaucracy, better coordination in authority	More sectorial management and coordination,	Interministerial crisis leading to new decentralised management
ACTOR B Civil society, companies, associations, syndicates, NGOs...	Higher level of participation, better awareness of the issues, more support from NGOs	Increase effort s to environment awareness, incentives from state to conservation and protection	Advocacy and examples of local action
ACTOR C Research and development	More applicable research to poorest population. More funds for R and D, More connection to end users	Provide accurate data to decision makers, need for new technologies	International projects meeting needs

Annex 4: Example of recommendations for a concrete roadmap in ICZM (Egypt, 2013)

Scenario / Item	**S 1. Utopia or Wonderland**	***S2. Planning in difficulties***	**S 3. Current situation**
SECTOR 1 Natural resources	Optimum use of resources, preservation and ensurance of sustainibility	More stress on available resources	Loss of natural resources
SECTOR 2 Industry and processing	Greener practices, less pollution, reduction of unemployment, Better income, added value of processing, more globalization	Slight improvement	Collapse of industry, rise of black work
SECTOR 3 Services	More services, in quality and quantity	Same situation or may be some slight improvement	Poor or limited services
ACTOR A State, region. authorities Ministries,	Better policy enforcement and rationalisation of policies and legislation, reduction of bureaucracy, better coordination in authorities	More sectorial management and coordination,	Interministerial crisis leading to new decentralised management
ACTOR B Civil society, assoc. NGOs...	Higher level of participation, better awareness of the issues, more support from NGOs	Increase effort s to environment awareness, incentives from state to conservation and protection	Advocacy and examples of local action
ACTOR C Research and development	More applicable research to poorest pop. More funds for R and D, More connection to end users	Provide accurate data to decision makers, need for new technologies	International projects meeting needs
Mix of common recommen-dations	1. Education, notably basic and) training (19 votes 2. More sectoral management and coordination 8 3. Incentives from govt for conservation and protection 2 4. National sectoral strategy for the delta 4 5. Extension to inland spaces and resources 5 6. Sort or review laws to control conflicts of interest 9 7. Ensure the participation of all stakeholders in decision making process 7 8. Encourage investors and clusters to serve the Society 5 9. Support sustainability in all decisions and selections 5 10. Better transfer of intl technology and appropriation 5 11. Share of databases among all decision makers 7 12. Enhancing public awareness as general 3 13. Promoting scientific research 7 14. Create new economic / urban centers 2 15. Support to green technology /ecology engineering 4 16. Better link between Academic science and Industry 9 17. Decentralisation 4		
Selection of a preferable and likely scenario		***S2. Planning in difficulties***	

Annex 5: Example of Matrix of scenarios for Indonesia (2008)

GENERAL SITUATION OF THE COUNTRY

HYPOTHESIS FIELD	1	2	3
DEMO GRAPHY	**Population size increasing 1.45 % per Yr (347 M)**	*High population density in Java (>50% of total pop.); (347) M*	emigration > immigration (negative) 1.2 % /yr (320 M)
ENVIRON MENT	Improved resource restoration and biodiversity including civic education (+ intl support)	***Extremely bad environment situation***	Reduced pollution In air and water Some waste management
GOVER NANCE	Good governance (Democracy + decentralisation + involvement of civil society)	**Medium Quality Governance (good & bad initiatives**)	*Chronic Crisis (Corruption, separatism, terrorism…)*
ECONOMICS	Slow increase thanks to non-tradable industries (3%)	High rate of growth related to long-term good governance and biodiversity	***No economic growth due to overpopulation, natural disasters and social issues***
SOCIETY	***Unemployment will increase, creating high social gap between huge poor class and middle class***	More stratified society	No change in the society
TECHNO LOGY (& SCIENCE)	*No government coordination Slow brain drain*	**Less means for S&T Technology gap increasing**	Improvement of government coordination Support to young scientists

Macro-Scenario 1 Bold : **"Higher urgent challenges"**
Macro-Scenario 2 Italic *: "Crisis & Unstability "*
Macro-Scenario 3 : "Improvement and better future"

Annex 6: Example of the impacts of 2 scenarios on the SECTORS of aquaculture (Indonesia, 2008); The 3rd scenario is not recorded for limited space for text

RESTRICTED TO AQUACULTURE SECTOR

Scenario FIELD	1. Higher urgent challenges		3. Improvement & better future
Fresh water aquaculture	**Reduced** Limitation for freshwater availability; Bad quality of products Some good quality spots		**Increase (less than for marine aquaC)** More controlled aquaC to protect biodiversity and aquatic ecosystems; Polycult. + Improved technologies Larger and larger scale dev.
Marine water aquaculture	**Limited development** Bad general quality of coastal waters High pressure on resources		**Sustainable devpt** High value species; New techno.: open sea cages, polyculture. Higher risks of diseases Risk of "capitalistic" short term investments
Rules & regulations	**Min. policy for AquaC**. Rules for food health control Frequent illegal dvpt Low level of support notably thru NGOs		**Complete & specific set of laws related to aquaC.** Support to "eco-management?" High level of control
Interactions with fisheries	**Overexploitation** of natural resources; decreasing supply Competition for access to sites		**A new relationship** Competition for access to sites & markets; need for partnership for agreement; set of artificial reefs; Better management of stocks (incl. restocking paid by govt)
Markets	**Limited potential** for aquac products; Need of import		**New markets opportunities** Numerous local and int'l markets Mix of various qualities & prices Price global increase Support for local production Aquatourism & advertisement
Image	**BAD**….. Some spots for Int'l tourism		**GOOD** Come and visit Indonesian aquaculture

Annex 7: Example of the priorities of all actors of aquaculture according to the 2 main scenarios (Indonesia, 2008)

RESTRICTED TO AQUACULTURE STAKEHOLDERS

Macro scenario Stakeholder	1. Higher urgent challenges		3. Improvement & better future
Relevant Ministries	**Awareness of importance of Aquaculture** Review of aquaculture policy **Cooperation** + NGOs + International bodies Japanese model for Fisheries for co-management of the coast **Special areas for development** Education to sustainability		**NO PROBLEM**
Chamber of commerce & industry	**Education** Mix with Tourism sector **Special areas** with support of Media & State & NGOs		Support of Govt, Media, NGOs Eco-tourism Shrimp, abalone, seaweeds **Diversification of species & products**
Banks	**Investments in some spots only** Partnership with int'l banks Support of NGOs Care + with biodiversity **Support of State for special loans**		**Share from 50 to 80 %in Aquac** Funds for Conservation projects Partnership with other banks **Lower tax from govt** + Tax free during the first 5 years
Fishermen associations	OK for the govt programme **Higher control penalties** for illegal fishing Support asked from Media NGOs		**Restocking programmes** And related training
NGOs Including Ecologists	**Polyculture for sustainability** **Better education & training** Freshwater aquac only on small islands		**Eco-tourism** **Eco-sustainability control** Intl NGOs assess the impacts
Media	Important role to play **Extended education**, infos for all Through all channels, press, radio, Internet Ask for better governance		Debates on aquaculture **Support to eco-friendly technologies** Interactions with foreign media